IN THE CLAIMS

Claims 1-17 - Cancelled

18. (Currently Amended) A system, comprising:

a computer system;

a manufacturing model coupled with said computer system, said manufacturing model being capable of generating and modifying at least one control input parameter signal;

a machine interface coupled with said manufacturing model, said machine interface being capable of receiving process recipes from said manufacturing model;

a processing tool capable of processing semiconductor wafers and <u>being operatively</u> coupled [with] <u>to</u> said machine interface, said [first] processing tool being capable of receiving at least one control input parameter signal from said machine interface;

a metrology tool coupled with said [first] processing tool [and said second processing tool], said metrology tool being capable of acquiring metrology data;

a scatterometry reference library, said scatterometry reference library comprising optical data related to a plurality of poly-silicon structures; and

a scatterometry data error analysis unit coupled to said metrology tool and said scatterometry reference library, said scatterometry data error analysis unit capable of comparing said metrology data from the metrology tool, to corresponding data in said scatterometry reference library, and calculating at least one of a necking error and a poly-silicon structure break error in response to said comparison.

19. (Currently Amended) The system of claim [18] 34, wherein said computer system is capable of generating modification data for modifying at least one control input parameter in response to said calculation of at least one of a necking error and a poly-silicon structure break error.

20. The system of claim 19, wherein said manufacturing model is capable of modifying said control input parameter in response to said modification data.

21. (Currently Amended) The system of claim [18] 34, wherein said metrology tool is a scatterometer.

Claims 22-32 - Cancelled

33. (Newly Added) A system, comprising:

a processing tool for processing at least one semiconductor wafer;

a metrology tool to acquire data relating to processing of said semiconductor wafer;

a controller operatively coupled to said processing tool and said metrology tool, said controller to:

access data from a reference library comprising optical data relating to a poly-silicon formation on a semiconductor wafer;

compare said metrology data to data from said reference library; and

perform a fault-detection analysis in response to said comparison of said metrology data and said reference library data for improving processing of a subsequent semiconductor wafer.

34. (Newly Added) The system of claim 33, further comprising:

a computer system;

a manufacturing model coupled with said computer system, said manufacturing model being capable of generating and modifying at least one control input parameter signal;

a machine interface coupled with said manufacturing model, said machine interface being capable of receiving process recipes from said manufacturing model;

said processing tool being operatively coupled to said machine interface, said processing tool being capable of receiving at least one control input parameter signal from said machine interface;

said metrology tool coupled with said processing tool, said metrology tool being capable of acquiring metrology data;

a scatterometry reference library, said scatterometry reference library comprising optical data related to a plurality of poly-silicon structures; and

a scatterometry data error analysis unit coupled to said metrology tool and said scatterometry reference library, said scatterometry data error analysis unit capable of comparing said metrology data from the metrology tool, to corresponding data in said scatterometry reference library, and calculating at least one of a necking error and a poly-silicon structure break error in response to said comparison.

35. (Newly Added) An apparatus, comprising:

a controller to control an operation of a processing tool and a metrology tool, said controller to:

acquire metrology data relating to processing of a semiconductor wafer in said processing tool, from said metrology tool;

access data from a reference library comprising optical data relating to a poly-silicon formation on a semiconductor wafer;

compare said metrology data to data from said reference library; and

perform a fault-detection analysis in response to said comparison of said metrology data and said reference library data for improving processing of a subsequent semiconductor wafer.

36. (Newly Added) The apparatus of claim 35, wherein said controller comprises a computer system that is capable of generating modification data for modifying at least one control input parameter in response to a calculation of at least one of a necking error and a poly-silicon structure break error from said fault detection analysis.

37. (Newly Added) The apparatus of claim 36, further comprising a manufacturing model that is capable of modifying said control input parameter in response to said modification data.